



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,242	06/20/2003	Phillip Dan Cook	ISIS-5213	6684
32650 7590 03/06/2007 WOODCOCK WASHBURN LLP CIRA CENTRE, 12TH FLOOR 2929 ARCH STREET PHILADELPHIA, PA 19104-2891			EXAMINER EPPS FORD, JANET L	
			ART UNIT	PAPER NUMBER
			1633	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/06/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/601,242	COOK ET AL.	
	Examiner	Art Unit	
	Janet L. Epps-Ford	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 44 and 69-73 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 44, 69-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/06/2006 has been entered.
2. Claims 44, and 69-73 are pending for examination.

Response to Arguments

3. The rejection of claim 44 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 6 of U.S. Patent No. 5,623,065, is withdrawn in reply to Applicant's filing of a terminal disclaimer 10/09/2006.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 44, and 69-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uhlmann et al., Cook et al., Secrist et al., and Sorge et al.

6. The instant claims are drawn to the following potential compounds: a) a region comprising consecutively linked alpha-nucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides.

b) a region comprising consecutively linked 4'-thionucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides.

c) a region comprising consecutively linked alpha-nucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides, and further comprising a region of consecutively linked alpha-nucleosides.

d) a region comprising consecutively linked alpha-nucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides, and further comprising a region of consecutively linked 4'-thionucleosides.

e) a region comprising consecutively linked 4'-thionucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides, and further comprising a region of consecutively linked 4'-thionucleosides.

f) a region comprising consecutively linked 4'-thionucleosides, and a region comprising at least 5 consecutive 2'-deoxyerythropentofuranosyl- β -nucleosides, and further comprising a region of consecutively linked alpha-nucleosides.

Uhlmann et al. describe the design of oligonucleotides comprising alpha-nucleosides, wherein the modified oligonucleotides proved to be astonishingly stable to nucleases (see page 556, section D.1.).

Cook et al. the following compound on page 163, line 33: 5'-Gaa-GTC-aCT-GgaaCG-3', wherein **a** is a 2'-deoxy- α -D-adenosine nucleoside. This compound

comprises a region of α -nucleosides and a region of β -deoxynucleosides synthesized by solid phase DNA synthesis from 5'-DMT-3'- β -cyanoethyldiisopropyl-phosphoramidite protected deoxynucleosides. This compound is interpreted as meeting all the limitations of the claimed compound, to the extent that it comprises two regions, a region comprising α -nucleosides, and a region comprising 2'-deoxyerythropentofuranosyl- β -nucleosides.

Secrist et al. (1991) teach the synthesis and biological activity of 2'-deoxy-4'-thiopyrimidine nucleosides. Secrist et al. teach that several 4'-thioribonucleosides are resistant to bacterial cleavage and that 4'-thioinosine is resistant to cleavage by purine nucleoside phosphorylase, and suggests that the replacement of furanose ring oxygen may generally confer resistance to phosphorylases. Secrist et al. further suggest that incorporation of these compounds into DNA molecules may confer some useful biological activity (see page 2361, 2nd paragraph).

Sorge et al. (US Patent No. 5,354,656) teach the end modification of nucleic acid molecules with an α -thio-deoxynucleoside to protect the 3' end of the molecule from cleavage.

The prior art describes polynucleotides containing, α -nucleoside or 4'-thionucleosides, and further comprising a region of 2'-deoxynucleosides, and the difference between the claimed invention and the prior art is merely the number of consecutive 4'-thio or α -nucleosides, and 2'-deoxynucleosides in an oligonucleotide. Since the general benefits of α -nucleoside or 4'-thionucleoside modifications in oligonucleotides were known in the art at the time of filing of the instant application, the

Art Unit: 1633

general characteristics of the claimed compounds of the instant invention were disclosed in the prior art. Absent evidence to the contrary, one of ordinary skill in the art, at the time of the instant invention would have been motivated to design the claimed oligonucleotides according to the present invention.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 44 and 69-73 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. (New Matter).

Applicants have amended the instant claims to recite regions comprising a ***plurality of consecutively 4'thionucleosides or α -nucleosides, linked by charged 3'-5' phosphorous linkages***, and further comprising a region of at least 5 consecutive 2'-deoxy-erythro-pentofuranosyl β -nucleosides. Although the specification as filed discloses, an oligonucleotide having mixed α - β nucleosides, see example 2, and having mixed 4'thionucleoside and 2'-deoxy-erythro-pentofuranosyl β -nucleosides, see example 7, there is no support in the specification as filed specifically for a region of undefined length of consecutively linked 4'thionucleosides or α -nucleosides, ***linked by charged 3'-5' phosphorous linkages***, and further comprising a region of at least 5

Art Unit: 1633

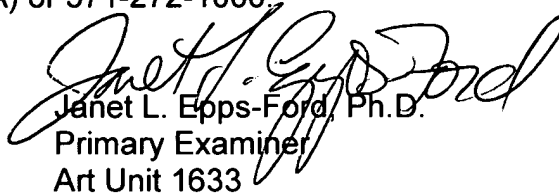
consecutive 2'-deoxy-erythro-pentofuranosyl β -nucleosides. The phrase "plurality of linked" 4'-thionucleosides or α -nucleosides, is supported in the specification as filed in the bridging paragraph of pages 6-7. However, this portion of the specification does not require that the "plurality of linked" nucleosides, are *consecutively* linked nucleosides of undefined length.

Applicant's amendment is therefore considered new matter, since the scope of the claimed invention is not supported by the specification as filed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janet L. Epps-Ford whose telephone number is 571-272-0757. The examiner can normally be reached on M-F, 10:00 AM through 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached on 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Janet L. Epps-Ford, Ph.D.
Primary Examiner
Art Unit 1633

JLE